DOCUMENT RESUME

ED 064 390 TM 001 637

AUTHOR Lawrence, Gordon
TITLE Use of Systematic Classroom Observation to Validate a Measurement of Teacher Beliefs About Teaching.
PUB DATE 72
NOTE 9p.; Paper presented at AERA annual meeting (Chicago, Ill., April 1972)

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS *Beliefs; *Classroom Observation Techniques; Correlation; Factor Analysis; *Field Studies; Item Analysis; *Measurement Instruments; Statistical Data; *Teacher Attitudes; Teacher Education; Teacher Qualifications; Tests

ABSTRACT

A paper and pencil instrument was developed consisting of statements about teaching practices appropriate for students of ages 10 through 14. The statements are to be accepted or rejected by the respondent teacher. This paper reports the procedures and results of a third field test and the design of a fourth field test. The third field test instrument consisted of 244 items. It was administered to 320 teachers in eight schools. Two hundred of the items underwent statistical treatment: item analysis and factor analysis. The next step was to identify which of the 200 items correlated with data from classroom observations. Four observation instruments were used. The raw scores from the observations, combined into sets and converted into ratios were then correlated with the paper and pencil item responses of the 40 teachers. Five statistical criteria were computed by which to check the strength of each paper and pencil item. Through these criteria 97 items were eliminated and 103 emerged. Of those that emerged: (1) Four-fifths of the items correlated both statistically and logically with one or more sets of observation data; (2) Forty-five of the items loaded in factors; (3) Twelve neither correlate with observation data nor load into factors but were retained because they discriminate well between high scorers and low scorers. When the instrument is fully developed it will be used as one part of a pre-training inventory procedure by which teacher trainees can obtain an estimate of their general competencies and a diagnosis as which to need development. Finally, systematic observation of classroom processes discriminates between teachers in many useful categories. (CK)

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEH REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY

11.3

ED 064390

Use of Systematic Classroom Observation to Validate A Measurement of Teacher Beliefs About Teaching*

Gordon Lawrence
University of Florida

Paper and pencil instruments designed to measure beliefs or attitudes are frequently used to aid in placing persons into jobs and are sometimes used for matching them with training situations. When such an instrument is used in that way, an assumption is made that the belief profile of the instrument is predictive of on-the-job behavior. The validity of that assumption has been tested in a variety of ways for different instruments; however, most such validity checks have been rather indirect.

In the teaching profession, the Minnesota Teacher Attitude Inventory is a case in point. During its development the MTAI was validated by the school administrator's judgment about the teacher, by pupil rating, and by rating of classroom observers according to some global categories of behavior. Systematic sampling of teacher behavior was not undertaken.

Systematic classroom observation instrument developed in recent years make possible a more direct testing of the linkage between teachers' belief statements and their overt teaching behavior. The research reported here is an effort to develop a paper and pencil instrument the responses to which are observable patterns of behavior as recorded by systematic classroom observation instruments. We used four well-researched observation instruments and categories of our own.

TM 001 637

The instrument being developed. The paper and pencil instrument we have been developing consists of statements about teaching practices appropriate for students of ages 10 through 14. The statements are to be accepted or rejected by the respondent teacher. Below are two examples of items:

a. Students seldom or never ask for clarification of what is discussed in classwork.
b. When students analyze their own accomplishments the learning outcome is superior to that which is accomplished through teacher evaluation.

The validation question concerning example A. above is whether the teacher who accepts that statement has a classroom in which fewer clarification questions are asked by students. And with example B. the validation question is whether the teacher who agrees that it is important for students to analyze their own learning outcomes does indeed have more student analyzing occurring in his classroom than does a teacher who rejects that item.

* A presentation at AERA 1972 Annual Meeting, Session 11.3

FILMED FROM BEST AVAILABLE COPY

The main task of our project is to produce paper and pencil items which meet several criteria, the chief one being correlation with systematic observation data. This paper reports the procedures and results of our third field test and the design of our fourth field test, now in progress.

Procedures. The third field test instrument consisted of 244 items. It was administered to 320 teachers in 8 schools. Two hundred of the items underwent statistical treatment: item analysis and factor analysis. The factor analysis showed about half the items loaded into small factor sets, with 2 to 5 items per factor. Nineteen factors were logically matched to the theoretical categories of itmes we started with.

The next step was to identify which of the 200 items correlated with data from classroom observation. Four observation instruments were used: the Reciprocal Category System (Ober, 1968), the Florida Taxonomy of Cognitive Behavior (Brown, et al, 1967), the Teacher Practices Observation Record (Brown, 1968), and the Florida Climate and Control System (Soar, unpublished). Between them these systems categorize and tabulate some 300 different elements of teacher and student behavior — cognitive and affective, verbal and non-verbal, procedures and climate.

Two of the observation instruments are tallied "live," and the other two (RCS and FTCB which register verbal behavior only) are tallied later from audio tapes made during the same observation sequences.

Twenty of the teachers whose responses agreed most with our scoring key and twenty teachers in least agreement were identified to be observed. Neither the teams of trained observers nor the teachers themselves were aware of the basis of selection of teachers. The teachers were informed that we were observing to see whether teaching styles related in some ways to the paper and pencil instrument. Each teacher was observed 12 times over a period of several days. Each observation had a duration of 5 minutes. The observations were made in sets of three, on four different occasions. Previous research using these observation instruments, mainly the research of the authors of the instruments, supports the observation schedule we used as fully adequate to obtain a representative sample of the behavior patterns of those classrooms.

The raw scores from the observations, combined into sets and converted into ratios as shown in Appendix A, were then correlated with the paper and pencil item responses of those 40 teachers.

Results of the statistical treatment. We had computed five statistical criteria by which to check the strength of each paper and pencil item: biserial r and discrimination index to check item correlation with total score on the instrument; difficulty

index; loading in a factor; and correlation with observation data.

Through these criteria, 97 items were eliminated. Below is a summary profile of the 103 items which emerged:

(a) Four-fifths of the items correlated both statistically and logically with one or more sets of observation data. Correlations range from .30 to .60. In effect, the attitude, disposition or mind-set represented in the response to each item has a counterpart in an observable behavior pattern in the classroom. Our procedure for selecting teachers to be observed appears to be well justified. The twenty teachers whose responses on the paper and pencil instrument most agreed with our scoring key also ranked as high scorers on the observation data; likewise the 20 who disagreed most had low scores on the observation keys, with a significant difference between the mean observation scores of the two groups (.001).

(b) Forty-five of the 103 items loaded in factors. A total of 19 factors emerged which logically match the theoretical categories of items.

(c) Twelve of the 103 items neither correlate with observation data nor load into factors but were retained because they discriminate well between high scorers and low scorers.

(d) A reliability estimate of .80 (Spearman-Brown Prophecy Formula) for the total 103 items was obtained by creating equivalent halves. That correlation is acceptable for this type of instrument.

Design of current research on the paper and pencil instrument. When the instrument is fully developed it will be used as one part of a pre-training inventory procedure by which teacher trainees can obtain an estimate of their general competencies and a diagnosis as to which competencies need development. The instrument now being field tested contains items which relate to 22 theoretical competency sets. When the task is finished, we expect to have the means to prepare for each respondent to the instrument a profile giving a score on each of the 22 competency sets. Now being tested are 480 items, with a population of 950 teachers. If half of those items survive the statistical treatment, we will have enough for the completed instrument. Procedures similar to those described above are being used, except this time the total score on the instrument will not be used; rather, scores of each of the 22 competency sets will be used.

We are also in the process of writing some new observation categories. The four observation instruments used in the third field test need to be supplemented by additional observation categories if we are to obtain adequate coverage for all 22 comptency

areas. It is not especially difficult to generate new observation categories. A category is regarded as reliable if inter-observer agreement of .85 or better is consistently obtained.

A final about the value of systematic observation of classroom processes: our experience shows that systematic observation discriminates between teachers in many useful categories. Until such time as research shows important correlations between teacher behavior and long term pupil growth, systematic observation of teacher influence on pupil classroom behavior is an especially valuable tool for teacher educators.

References

1. Brown, Bob Burton, R. Ober, R. Soar, and Jeannie Nelson Webb. "The Florida Taxonomy of Cognitive Behavior: Directions." University of Florida, Gainesville, 1967 (mimeographed).

2. Brown, Bob Burton. The Experimental Mind in Education. New York: Harper and Row Publishers, 1968.

3. Ober, Richard L. "The Reciprocal Category System." West Virginia University, Morgantown, 1968 (mimeographed).

4. Soar, Robert S. "The Florida Climate and Control System." University of Florida, Gainesville, (mimeograpghed).

APPENDIX A

Observation Elements

The Reciprocal Category System includes Elements I through VI

Element I: deals with the warm-cool subscale of the RCS and expresses the ratio of $\frac{\text{warm}}{\text{cool}}$ teacher behavior.

Element II: deals with the accept-correct subscale of the RCS and expresses the ratio of $\frac{\text{accept}}{\text{correct}}$ teacher behavior.

Element III: deals with the indirect-direct subscale of the RCS and expressed the ratio of $\frac{\text{amplifies}}{\text{directs}}$ teacher behavior.

Element IV: expresses the $\frac{\text{warm}}{\text{cool}}$ ratio of student behavior.

Element V: expresses the $\frac{\text{accept}}{\text{correct}}$ ratio of student behavior.

Element VI: expresses the $\frac{\text{indirect}}{\text{direct}}$ ratio of student behavior.

The Florida Taxonomy of Cognitive Behavior includes Elements VII and VIII

Element VII: is the ratio of teacher behavior in category 1 of the taxonomy (knowledge) over teacher behavior in categories 2, 3, 4, 5, 6 and 7.

$$\frac{\text{Teacher behavior 1}}{\text{Teacher behavior 2\&3\&4\&5\&6\&7}}$$

Element VIII: is the ratio of student behavior in category 1 of the taxonomy over student behavior in categories 2,3,4,5,6 and 7.

$$\frac{\text{Student Behavior 1}}{\text{Student Behavior 2\&3\&4\&5\&6\&7}}$$

The TPOR (Teacher Practice Observation Record) includes Elements XI through XV.

Element XI: refers to the nature of the situation (A) in the TPOR, and expresses the ratio of experimental (2-4-6-8-10) to non-experimental (1-3-5-7-9) teacher behavior.

$$\frac{\text{total even T. behaviors}}{\text{total odd T. behaviors}}$$

Element XII: refers to the nature of the problem (B), development of ideas (C) and the use of subject matter (D) in the TPOR. It expresses the ratio of experimental to non-experimental teacher behaviors in these categories

$$\frac{\text{total even T. behaviors}}{\text{total odd T. behaviors}}$$

Element XIII: refers to the evaluation (E) category in the TPOR and expresses the ratio of experimental teacher behavior

$$\frac{\text{total even T. behaviors}}{\text{total odd T. behaviors}}$$

Element XIV: refers to the differentiation (F) category of the TPOR, and expresses the ratio of experimental to non-experimental teacher behavior.

$$\frac{\text{total even T. behaviors}}{\text{total odd T. behaviors}}$$

Element XV: refers to the motivation-control (G) category of the TPOR, and expresses the ratio

$$\frac{\text{total even T. behaviors}}{\text{total odd T. behaviors}}$$

The Florida Climate and Control System includes Elements XVI through XX.

Element XVI: expresses the ratio of pupil limited choice in the FLACCS pupil no choice

Element XVII: refers to teacher positive verbal control in the FLACCS and expresses the amount of teacher positive verbal control

$$\frac{\text{actual T. positive control verbal behaviors}}{\text{total number of observation cells in this group}}$$

Element XVIII: refers to teacher negative verbal control behaviors in the FLACCS

$$\frac{\text{actual T. negative control verbal behaviors}}{\text{total number of observation cells in this group}}$$

Element XIX: deals with teacher non-verbal control behaviors in the FLACCS and expresses the ratio of positive to negative teacher non-verbal control behaviors

$$\frac{\text{total positive teacher non-verbal control behaviors}}{\text{total negative teacher non-verbal control behaviors}}$$

Element XX: expresses the ratio of positive teacher affective (climate) behavior over negative teacher affect in the FLACCS.

$$\frac{\text{total positive verbal and non-verbal teacher behaviors}}{\text{total negative verbal and non-verbal teacher behaviors}}$$

The following six elements (XXI to XXVI) deal with specific behaviors defined by the researchers.

Element XXI: expresses the amount of teacher contact with other teachers or resource persons

$$\frac{\text{actual observed contacts}}{\text{total number of contact cells}}$$

Element XXII: deals with the amount of student interest when working in small groups

$$\frac{\text{actual observed behavior}}{\text{total number of behavior cells}}$$

Element XXIII: deals with the amount of student distraction when working in small groups

$$\frac{\text{actual observed behaviors}}{\text{total number of behavior cells}}$$

Element XXIV: deals with the amount of student disruption when working in small groups

$$\frac{\text{actual observed behaviors}}{\text{total number of behavior cells}}$$

Element XXV: deals with the amount of teacher to student socialization

$$\frac{\text{actual observed behaviors}}{\text{total number of behavior cells}}$$

Element XXVI: deals with the types of instructional materials used in the classroom

$$\frac{\text{total materials used}}{\text{total number of materials cells}}$$

For Elements VII, VIII, XVIII, XXIII and XXIV a favorable score is a negative one. That is, negative scores are expected to correlate with the paper and pencil instrument.